State of California — Business, Transportation and Housing Agency

Memorandum

To: DISTRICT LANDSCAPE ARCHITECTS

Date: May 12, 1994
File: 427

From: DEPARTMENT OF TRANSPORTATION - DIVISION OF STATE AND LOCAL PROJECT DEVELOPMENT, OFFICE OF LANDSCAPE ARCHITECTURE

Subject: Pitch Canker Disease and the Planting of Pine Trees

The research study on pitch canker disease performed by Dr. Thomas R. Gordon, Associate Professor, Department of Pathology, University of California, Berkeley has been completed. Dr. Gordon has provided us with a Pitch Canker Risk Rating System to assist in determining the risks of planting pines. This information is attached for your reference. The manuscript for the research (Forest Note) prepared for the California Department of Forestry and Fire Protection is expected to be available soon. We will provide you with that information when it is available.

Pinus brutia species may be planted in all locations. Based on the attached rating system, we have developed the following standards for specifying the planting of additional pines. Pines may be specified for planting when their combined risk rating is in the two to five value. For example, Pinus jeffreyi (Jeffrey pine), pine species category 3, may be planted in the Sacramento Valley north of the delta, location category 2, because the sum of the two components totals 5. The combined risk rating is interpreted as "low risk".

Where mitigation measures require the planting of pines and the combined risk rating is greater than five, Caltrans District Landscape Specialist and the control agency, e.g., Department of Forestry, Department of Food and Agriculture, should be contacted to verify that a change cannot be made. If not, this may be treated as an exception. Contact the District Landscape Architecture Coordinator for an exception.

If you have any questions or need additional information regarding pitch canker disease, contact Ms. Dawn Grinstain, (916) 654-4704 or 8-464-4704.

ORIGINAL SIGNED BY GARY W. BUSH

DG:bw
bcc: GBush/DGrinstain
TGordon, UCBerkeley
HOrtmann, Dept. of Parks and Rec.
BColeman

GARY W. BUSH, Chief
Office of Landscape Architecture

Attachments

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COLLEGE OF NATURAL RESOURCES
AGRICULTURAL EXPERIMENT STATION
DEPARTMENT OF PLANT PATHOLOGY
147 HILGARD HALL

BERKELEY, CALIFORNIA 94720

4 February 1994

Dawn Grinstain
Senior Landscape Architect
Cal Trans
1120 N. Street
Sacramento, CA 95814

Dear Dawn:

Enclosed please find a copy of the pitch canker risk rating system which we have prepared for you. This system pertains specifically to pines, the principal hosts to pitch canker. However, Douglas fir, which also is susceptible to pitch canker, could be included as well and would be placed in host category 4.

As we gain more information about pitch canker, we may decide to modify the present system. If nothing else, the distribution of the disease will change over time and this will necessitate alterations in the risk ratings accorded to certain locations. This would most likely have a small effect on the estimated risk in most situations. Nevertheless, we can provide annual revisions if you think such changes might influence your policies on species selection. If any aspects of the our risk rating system require clarification, please give me a call. Similarly, let me know if you have any suggestions as to how we could make this system more useful for your purposes.

We are in the final stages of editing a manuscript (Forest Note) for the California Department of Forestry and Fire Protection. I will send you a copy as soon as it is finalized. It provides additional information about pitch canker which you may find useful.

Sincerely,

Thomas R. Gordon

Thomas R. Gordon
Associate Professor

Pitch canker risk rating system for native and exotic pine species to be grown in California

The risk due to pitch canker is calculated as the sum of two components: 1) the pine species and 2) the location. Each of the two components is assigned a number ranging from 1 to 5, thus the sum of the two will range from 2 to 10. The totals may be interpreted as follows:

Rating	Interpretation
≥ 8	High risk of damage due to pitch canker
6-7	Moderate risk
4-5	Low risk
2-3	Very low risk

The host factor

The number assigned to each species is based on our current knowledge of the inherent susceptibility of the species (as determined from greenhouse inoculation experiments) and the occurrence of naturally infected trees in California (as of 2/94). Numbers are assigned according to the following criteria:

Category	Criteria
5	Pitch canker infections are common in some areas
4	Naturally infected trees have been observed
3	The species is known to be susceptible but naturally infected trees have not been observed
2	No natural infections have been observed and no representatives of the species have been tested for susceptibility
1	Greenhouse inoculation tests indicate the species is resistant to pitch canker

	Species (common name)
Category 5	*Pinus radiata* (Monterey pine) and *P. muricata* (Bishop pine)
Category 4	*Pinus contorta* ssp. *contorta* (shore pine), *P. attenuata* (knobcone), *P. radiata* x *P. attenuata*, *P. Torreyana* (Torrey pine), *P. ponderosa* (yellow pine) *P. sabiniana* (digger pine) and *P. coulteri* (Coulter pine), *P. halepensis* (Aleppo pine), *P. pinea* (Italian stone pine) and *P. canariensis* (Canary Island pine)
Category 3	*Pinus jeffreyi* (Jeffrey pine), *P. lambertiana* (sugar pine), *P. sylvestris* (scotch pine) and *P. eldarica* (eldarica pine)
Category 2	All pine species not included in one of the other categories*
Category 1	*Pinus brutia*

*It would be preferable to test pines in this category for susceptibility to pitch canker, rather than to estimate the risk based on their assignment to category 2.

The location factor

Locations are rated based on the climatic regime and the present distribution of pitch canker

Category	Criteria
5	Pitch canker is prevalent
4	Some pitch canker infected trees have been observed, infected trees may be abundant in some locales
3	No pitch canker infected trees presently known to occur but there are no obvious barriers to movement of the disease into this area
2	Climate and/or distance from presently infested sites make the occurrence of pitch canker unlikely
1	Climate and distance from presently infested sites make the occurrence of pitch canker very unlikely

Category 5	Santa Cruz, Monterey, Alameda and San Luis Obispo Counties
Category 4	San Mateo, San Francisco[1], Santa Clara, Sonoma, Santa Barbara, San Diego, Mendocino and Los Angeles Counties
Category 3	San Benito, Orange[2], Ventura, Napa, Marin, Lake, Humboldt, Del Norte, Contra Costa[2], Solano, and the delta regions encompassed by Sacramento and San Joaquin Counties, those portions of San Bernardino and Riverside Counties which are part of the Los Angeles basin
Category 2	Sacramento Valley north of the delta, the San Joaquin Valley south of the delta, Sierran and coastal range foothills bordering the San Joaquin and Sacramento Valleys (up to 7000 feet), high elevation and desert areas of San Bernardino and Riverside Counties, and Imperial County.
Category 1	Inyo, Mono, Alpine, Lassen, Siskyou and Modoc Counties, east of the main axis of the Sierra Nevada in Plumas and Sierra Counties, and portions of other counties where elevations in the coastal mountains, the Sierra Nevada, or the Cascade Range exceed 7000 feet

[1] Although no pitch canker infected trees are now known to occur in San Francisco, it represents a small enough area that it is prudent to include it in the same category as bordering San Mateo County, where pitch canker does occur.
[2] There are unconfirmed reports of pitch canker in these areas, if confirmed they will be upgraded to category 4

Qualifications

Because ratings are assigned to rather broad geographical areas, the numbers will overstate the risk in some areas and understate it in others. For example, although there is a low incidence of pitch canker in Sonoma County, in parts of the city of Santa Rosa there are many diseased trees. As such, if rated separately, Santa Rosa would be category 5 (rather than 4). On the other hand. in Mendocino County pitch canker has only been confirmed on two trees. Consequently some areas of this county may be very distant from any infected trees and, if political boundaries were drawn differently, would be placed in category 3 (rather than 4).

It should also be noted here that pitch canker, at present, is a disease of coastal California. Based on pine species susceptibility, temperature limitations on the pathogen and the availability of insect vectors, we know of no reason why the disease should not occur in more inland locations. Our risk rating system reflects the assumption that the absence of pitch canker in, for example, the Sierra foothills, is due to merely to chance. That is, the pathogen has simply not yet been introduced or has failed to become established but is nevertheless capable of causing disease on susceptible species in these areas. However, it is possible there are reasons, of which we are presently unaware, why pitch canker cannot occur very far from the coast. If so, our rating system overstates the risk to pine plantings in some of these inland areas.

Finally, as will be apparent from the above rating system, all pine species have some risk of sustaining damage due to pitch canker. However, it should be borne in mind that most alternative landscape trees will also be at risk of damage from one or more insects or diseases. Thus, one should not necessarily regard a finite risk of sustaining a pitch canker infection as reason to eliminate all pine species from consideration as landscape trees. Rather, this risk should be among the factors considered when selecting appropriate trees for any given location.

Prepared by:

Thomas R. Gordon
Andrew Storer

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